

*Observations of the Satellite of Neptune from Photographs taken at the Royal Observatory, Greenwich, between 1903 December 4 and 1904 April 18.*

(Communicated by the Astronomer Royal.)

The following measures of position angle and distance of *Neptune's* satellite were made from photographs taken with the 26-inch refractor of the Thompson equatorial. The occulting shutter was used, as in previous years, the photographs being taken by Messrs. Davidson, Edney, or Melotte. The photographs were measured in a position micrometer in direct and reversed positions by Mr. Dyson and Mr. Edney. The tabular positions with which comparison is made were computed from the data given in the *Connaissance des Temps*, based on Dr. H. Struve's elements, the eccentricity of the orbit being neglected on account of the uncertainty in the present position of peri-astron. For fuller particulars as to the photographs and their measurement reference may be made to a previous paper in the *Monthly Notices*, vol. lxii. pp. 622-626.

NEPTUNE AND SATELLITE.

*Position Angle and Distance, from Photographs taken with the 26-inch Refractor.*

Date and G.M.T.					Position Angle.			Distance.			Remarks.	
					Observed.	Tabular.	T-O.	Observed.	Tabular.	T-O.		
1903.	d	h	m	s								
Dec.	4	11	20	34	97°25	97°70	+ 0°45	16''46	16''56	+ 0''10		
	8	12	32	26	225°60	226°72	+ 1°12	13°28	13°40	+ °12		
	9	11	25	46	145°03	146°41	+ 1°38	12°32	11°98	- °34		
	9	12	10	35	142°94	143°97	+ 1°03	12°11	12°15	+ °04		
	10	11	8	18	91°03	92°95	+ 1°92	16°76	16°80	+ °04		
	10	11	47	50	91°53	91°86	+ 0°33	17°02	16°81	- °21		
	14	10	43	25	223°17	223°66	+ 0°49	13°03	13°13	+ °10		
	15	11	40	23	135°15	136°47	+ 1°32	12°68	12°72	+ °04		
	17	10	26	21	40°08	40°32	+ 0°24	13°05	12°84	- °21		
	30	11	14	11	297°34	298°44	+ 1°10	14°36	14°49	+ °13		
	30	11	51	15	296°50	297°11	+ 0°61	14°54	14°62	+ °08		
	31	11	11	28	254°55	255°18	+ 0°63	16°71	16°44	- °27	Definition very poor.	
	31	11	42	41	252°84	254°26	+ 1°42	16°28	16°37	+ °09	Definition very poor.	
1904.												
Jan.	6	10	55	54	249°35	250°28	+ 0°93	15°83	16°04	+ °21		
	13	9	1	24	177°16	179°21	+ 2°05	11°15	11°00	- °15		
	13	9	33	25	176°68	177°04	+ 0°36	11°10	10°99	- °11		
	14	10	4	22	105°00	105°53	+ 0°53	16°09	15°79	- °30		
	14	10	39	39	103°04	104°42	+ 1°38	15°98	15°90	- °08		
	15	10	0	32	62°79	63°48	+ 0°69	15°25	15°34	+ °09		

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Date and G.M.T.					Position Angle.		T-O.	Distance.		T-O.	Remarks.
1904.	d	h	m	s	Observed.	Tabular.		Observed.	Tabular.		
Jan.	15	10	26	13	61°61	62°61	+ 1°00	15''22	15''25	+ ''03	
	15	10	50	46	60°48	61°77	+ 1°29	15°21	15°16	- '05	
	16	10	26	49	348°52	347°94	- 0°58	(10°50)	11°05	+ (°55)	Definition poor.
	19	9	51	5	164°71	164°60	- 0°11	11°02	11°11	+ '09	
	19	10	40	35	159°81	161°47	+ 1°66	10°92	11°19	+ '27	Definition poor.
	22	8	5	12	344°93	345°77	+ 0°84	11°25	11°07	- '18	Definition very poor. Satellite elongated.
Feb.	2	9	50	18	44°36	43°34	- 1°02	13°06	13°15	+ '09	
	5	8	47	49	222°16	222°16	0°00	12°95	13°04	+ '09	
	5	9	13	49	220°51	220°96	+ 0°45	12°82	12°92	+ '10	
	5	9	38	35	219°55	219°80	+ 0°25	12°76	12°82	+ '06	
	5	9	58	30	217°28	218°85	+ 1°57	12°72	12°74	+ '02	
	6	9	29	55	135°26	135°59	+ 0°33	12°15	12°52	+ '37	Satellite diffused and touching halo of the planet.
	13	7	49	43	83°62	83°67	+ 0°05	16°64	16°70	+ '06	
	13	8	17	55	82°70	83°90	+ 1°20	16°67	16°69	+ '02	
	15	9	13	47	302°83	304°19	+ 1°36	13°45	13°51	+ '06	
	15	9	48	6	301°56	302°76	+ 1°20	13°57	13°66	+ '09	
	17	9	22	7	202°12	202°07	- 0°05	11°37	11°52	+ '15	
	17	9	49	38	199°97	200°52	+ 0°55	11°48	11°44	- '04	
Mar.	10	7	47	25	281°40	281°73	+ 0°33	15°53	15°68	+ '15	
	10	8	17	37	280°48	281°12	+ 0°64	15°76	15°73	- '03	
	11	8	13	44	237°91	238°79	+ 0°88	14°40	14°59	+ '19	Definition very poor.
	11	8	43	53	237°77	237°72	- 0°05	14°74	14°47	- '27	Definition poor.
	11	9	14	52	236°23	236°60	+ 0°37	14°69	14°35	- '34	Definition poor.
	11	9	48	4	233°56	235°38	+ 1°82	14°14	14°21	+ '07	Definition poor.
	21	8	36	48	324°13	324°42	+ 0°29	(10°98)	11°57	+ (°59)	Satellite badly de- fined and in halo of the planet.
	21	9	7	8	321°21	322°86	+ 1°65	11°40	11°67	+ '27	Definition poor.
	21	9	38	58	319°15	321°15	+ 2°00	(11°10)	11°78	+ (°68)	
	21	10	14	2	317°92	319°29	+ 1°37	11°70	11°91	+ '21	
Apr.	6	8	0	6	78°02	79°19	+ 1°17	15°63	16°11	+ '48	
	6	8	33	43	77°54	78°24	+ 0°70	15°83	16°06	+ '23	
	12	8	8	59	72°69	73°92	+ 1°23	15°48	15°74	+ '26	
	16	8	24	55	184°53	185°52	+ 0°99	10°61	10°59	- '02	Definition poor.
	16	9	1	35	182°40	183°15	+ 0°75	10°36	10°55	+ '19	
	18	8	25	5	68°36	68°15	- 0°21	15°04	15°20	+ '16	
	18	9	4	50	66°84	66°91	+ 0°07	14°80	15°08	+ '28	Definition very poor.

*New Variable Stars found on the Astrographic Plates at the Royal Observatory, Greenwich.*

(Communicated by the Astronomer Royal.)

In the course of the work for the *Astrographic Catalogue* under Mr. Hollis's direction a star whose approximate position for 1900 is R.A.  $8^h 14^m 5^s$ , Dec.  $+73^\circ 25'.6$ , has been found to be variable to the extent of about three magnitudes. The following table gives the measured diameter (unit =  $0''.15$ ) and that of neighbouring comparison stars whose magnitudes have been inferred from the formulæ

$$m = 16.1 - 0.84 \sqrt{d} \text{ for exposure 40 minutes}$$

$$m = 13.7 - 0.77 \sqrt{d} \quad \text{,,} \quad 6 \quad \text{,,}$$

given in vol. i. of the Greenwich Section of the *Astrographic Catalogue*, p. xxx. The magnitude of the variable on the different plates is readily obtained by comparison with these standards.

No. of Plate.	Date.	Exp.	Measured Diameters.							Deducted Mag. of Variable.
			Var.	$\alpha$ m	$\beta$ m	$\gamma$ m	$\delta$ m	$\epsilon$ m	$\zeta$ m	
			13.0	12.1	11.5	10.8	10.0	9.6		
		min.								m
3782	1897 Dec. 20	40	20	—*	20	30	42	54	62	12.1
4288	1898 Feb. 21	40	16	12	22	26	42	66	64	12.6
4320	1899 27	40	38	6	16	24	34	38	50	10.0
4361	1899 Mar. 11	40	16	14	22	32	42	56	64	12.8
4761	1900 Jan. 2	6	5	6	12	19	26	38	44	13.1
4793	1900 24	6	22	3	8	11	20	26	34	10.5
6004	1902 Mar. 25	40	22	10	16	20	30	40	42	11.4
6010	1902 27	40	28	12	18	24	36	46	58	11.3

The positions of the variable and reference stars are as follows :

Variable	Zone and No. in <i>Astrogr. Catalogue.</i>	Zone and No. in B.D.	Approximate Position, 1900.	
			R.A.	Dec.
			h m s	° ' "
Variable	73, 3544		8 14 5	73 26
$\alpha$	73, 3547		8 17 12	73 28
$\beta$	73, 3514		8 16 34	73 15
$\gamma$	73, 3525		8 16 18	73 15
$\delta$	73, 3545		8 16 21	73 29
$\epsilon$	73, 3509	73, 417	8 21 8	73 7
$\zeta$	73, 3523	73, 411	8 13 56	73 19

A star, whose approximate position for 1900.0 is R.A.  $19^h 40^m 38^s$ , Dec.  $+80^\circ 42'$ , is suspected of being variable, and further photographs are being taken for comparison.

\* Not shown, owing to fog on plate.